

is configured for percutaneous introduction into the patient's vasculature, comprising:

a) an intravascular catheter having

an elongated shaft which is long enough for advancement through the patient's vasculature to the region within the patient's body where the procedure is to be performed and which has proximal and distal ends,

a relatively short distal shaft section,

a proximal shaft section much longer than the distal shaft section,

means on the distal shaft section to perform the procedure,

a distal guidewire opening in the distal end of the shaft,

a proximal guidewire opening spaced a relatively short distance proximally from the means to perform the procedure and a relatively long distance from the proximal end of the shaft, and

a guidewire passageway which extends between the distal guidewire port and the proximal guidewire port; and

b) a guidewire which is longer than the catheter and which is slidably disposed within the guidewire passageway to facilitate

delivery of the catheter thereover to the region within the patient's body where the procedure is to be performed.

31. The intravascular assembly of claim 31 wherein the means to perform the procedure is in communication with an exterior portion of the distal shaft section.

32. In an intravascular assembly for performing a procedure within a region of a patient's body which is configured for percutaneous introduction into the patient's vasculature and for intravascular delivery to a region within the patient's body where the procedure is to be performed

- a) an elongated catheter which has
- an elongated shaft with proximal and distal ends, a relatively short distal shaft section and a proximal shaft section much longer than the distal shaft section,
  - means to perform the procedure on the distal shaft section,
  - a distal guidewire port in the distal end of the shaft,
  - a proximal guidewire port spaced a relatively short distance proximally from the means to perform the procedure and a relatively long distance from the proximal end of the shaft, and

a guidewire passageway which extends between the distal guidewire port and the proximal guidewire port; and

b) an elongated guidewire which is longer than the catheter and which is slidably disposed within the guidewire passageway to facilitate advancement of the catheter over the guidewire through the patient's vasculature to said region while maintaining the position of the guidewire within the patient's vasculature.

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33. In a balloon dilatation catheter assembly for performing an angioplasty procedure within a region of a patient's which is configured for percutaneous introduction into the patient's vasculature and for intravascular delivery to a coronary artery where the procedure is to be performed

a) an elongated catheter which has

an elongated shaft with proximal and distal ends, a relatively short distal shaft section, a proximal shaft section much longer than the distal shaft section and an inflation lumen extending therein,

a dilatation balloon on the distal shaft section having an interior in fluid communication with the inflation lumen,

a distal guidewire port in the distal end of the shaft,

a proximal guidewire port spaced a relatively short distance proximally from the dilatation balloon and a relatively long distance from the proximal end of the shaft, and

a guidewire passageway which extends between the distal guidewire port and the proximal guidewire port; and

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b) an elongated guidewire which is at least as long as the catheter and which is disposed within the guidewire passageway to facilitate advancement of the catheter through the patient's vasculature over the guidewire to the patient's coronary artery while maintaining the position of the guidewire within the patient's vasculature.

34. The balloon dilatation catheter assembly of claim 33 wherein the guidewire passageway is at least 10 in. length.

35. An intravascular catheter which has means for performing a procedure within a region of a patient's body and which is configured for percutaneous introduction into the patient's vasculature, comprising:

a) an elongated shaft which is configured for percutaneous introduction into the patient's vasculature, which is long enough for advancement through the patient's vasculature to the region of the

patient's body where the procedure is to be performed and which has proximal and distal ends;

- b) a relatively short distal shaft section;
- c) a proximal shaft section much longer than the distal shaft section;
- d) means on the distal shaft section to perform the procedure;
- e) a distal guidewire port in the distal end of the shaft;
- f) a proximal guidewire port spaced a relatively short distance proximally from the means to perform the procedure and a relatively long distance from the proximal end of the shaft; and
- g) a guidewire passageway at least 10 cm in length which extends between the distal guidewire port and the proximal guidewire port.

36. A balloon dilatation catheter for performing an angioplasty procedure within a patient's coronary artery which is configured for percutaneous introduction into the patient's vasculature and for intravascular delivery to the coronary artery where the angioplasty procedure is to be performed, comprising:

- a) an elongated shaft with proximal and distal ends, a relatively short distal shaft section, a proximal shaft section much

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longer than the distal shaft section and an inflation lumen extending therein;

b) a dilatation balloon on the distal shaft section having an interior in fluid communication with the inflation lumen;

c) a distal guidewire port in the distal end of the shaft;

d) a proximal guidewire port spaced a relatively short distance proximally from the dilatation balloon and a relatively long distance from the proximal end of the shaft; and

e) a guide wire passageway at least 10 cm in length which extends between the distal guidewire port and the proximal guidewire port.

Please amend claims 18 and 23-28 as indicated below:

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18. (Amended) An elongated intravascular assembly for performing a procedure at a location within a <sup>human</sup> patient's coronary artery including a guidewire and a catheter which is adapted for rapid exchange over the guidewire without the utilization of an exchange wire or an extension wire, the assembly comprising:

a) an elongated catheter with a catheter shaft [having] which has proximal and distal ends, which is configured for percutaneous introduction into and advancement within the patient's vasculature, which is sufficiently long to be advanced through the

patient's femoral artery and into the patient's coronary artery and  
which has,

a distal shaft section which is configured for  
advancement within <sup>the</sup> a patient's coronary artery [and which  
has],

a distal guidewire [port] opening in the distal end of the  
catheter shaft,

a proximal guidewire [port] opening spaced a relatively  
short distance proximally from the distal guidewire [port]  
opening and a relatively long distance from the proximal end of  
the catheter shaft, [and]

an inner lumen [extending] which extends between the  
distal guidewire [port] opening and the proximal guidewire [port]  
opening and which is configured to slidably receive a guidewire  
therein, and

a proximal shaft section much longer than the distal shaft  
section;

b) means on the distal shaft section to perform an  
intravascular procedure which is spaced closer to the distal guidewire  
[port] opening than the proximal guidewire [port] opening; and

c) a guidewire which is longer than the catheter to extend  
out of the distal end of the catheter into the patient's coronary artery  
beyond the location therein where the procedure is to be performed

C<sup>2</sup>  
and which is slidably disposed within the inner lumen extending between the distal guidewire [port] opening and the proximal guidewire [port] opening.

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D27  
23. (Amended) An elongated balloon dilatation catheter assembly for performing an angioplasty procedure at a location within a patient's coronary artery which has means for the rapid exchange of a balloon dilatation catheter over a guidewire without the utilization of an exchange wire or an extension wire, comprising:

a) an elongated balloon dilatation catheter which is configured for percutaneous introduction into a patient's femoral artery and advancement into the patient's coronary artery and which has [having]

C<sup>3</sup>  
[a] an elongated catheter shaft with proximal and distal ends, an inflation lumen and a guidewire receiving lumen extending therein,

a distal guidewire [port] opening in the distal end of the catheter shaft in fluid communication with the guidewire lumen,

a proximal guidewire [port] opening spaced a short distance proximally from the distal guidewire [port] opening and a substantial distance from the proximal end of the catheter shaft and in fluid communication with the guidewire lumen;



an inflatable dilatation balloon on a distal shaft section having proximal and distal ends, with the distal end of the balloon being spaced closer to the distal guidewire [port] opening than the proximal end of the balloon is spaced from the proximal guidewire [port] opening, and having an interior which is in fluid communication with the inflation lumen; and

b) a guidewire which is sufficiently long to be advanced through the patient's femoral artery and into the patient's coronary artery beyond the location therein where the angioplasty procedure is to be performed and which is slidably disposed within the guidewire lumen of the balloon dilatation catheter [and which has a portion extending out the distal port and a portion extending out of the proximal port].

24. (Amended) A method for performing an intravascular procedure at a desired location within a patient's artery, comprising:

- a) providing an elongated guidewire within the patient's vasculature with a distal portion of the guidewire extending within the patient's artery and crossing [a] the desired location therein for performing an intravascular procedure and a proximal portion which extends out of the patient;
- b) providing an intravascular catheter comprising:

an elongated catheter shaft having proximal and distal ends and a guidewire receiving inner lumen extending therein to the distal end of the shaft,

a distal guidewire [port] opening in the distal end of the catheter shaft in fluid communication with the guidewire receiving inner lumen,

a proximal guidewire [port] opening spaced a relatively short distance proximally from the distal guidewire [port] opening and a relatively long distance from the proximal end of the catheter shaft in fluid communication with the guidewire receiving inner lumen, and

means to perform an intravascular procedure on a distal portion of the catheter shaft between the proximal and distal guidewire openings which is configured to perform said procedure in a patient's artery,

c) mounting the intravascular catheter onto the proximal portion of the guidewire which extends out of the patient with the proximal portion of the guidewire being slidably disposed within the guidewire-receiving lumen of the intravascular catheter and extending out the proximal guidewire [port] opening;

d) [advancing] introducing the intravascular catheter into the patient's vasculature over the guidewire, while holding a portion of the guidewire which extends out of the proximal guidewire [port] opening

in position and advancing the catheter therein[,] until the means to perform an intravascular procedure is positioned within a desired location within the patient's artery;

e) performing an intravascular procedure at the desired location within the artery by said means; and

f) withdrawing the intravascular catheter from the patient.

25. (Amended) A method for performing [an] a balloon dilatation angioplasty procedure within a patient's coronary artery, comprising:

a) providing an elongated guidewire within the patient's vasculature with a distal portion of the guidewire extending within the patient's coronary artery and crossing a desired location therein for performing [an] a balloon dilatation angioplasty procedure and with a proximal portion extending out of the patient;

b) providing a balloon dilatation catheter comprising:  
an elongated catheter shaft having proximal and distal ends, [and] an inflation lumen and a guidewire receiving lumen  
and being configured for percutaneous introduction into the  
patient's arterial system,

a distal guidewire [port] opening in the distal end of the catheter shaft in fluid communication with the guidewire receiving lumen,

a proximal guidewire [port] opening spaced a relatively short distance proximally from the distal guidewire [port] opening and a relatively long distance from the proximal end of the catheter shaft in fluid communication with the guidewire receiving lumen,

a dilatation balloon on a distal portion of the catheter shaft which has an interior in fluid communication with the inflation lumen extending within the [distal] shaft [section],

c) mounting the balloon dilatation catheter onto the proximal portion of the guidewire which extends out of the patient with the proximal portion of the guidewire being slidably disposed within the guidewire-receiving lumen of the balloon dilatation catheter and extending out the proximal guidewire [port] opening;

d) [advancing] percutaneously introducing the balloon dilatation catheter into the patient's [vasculature] arterial system over the guidewire and advancing the balloon dilatation catheter therein, while holding a portion of the guidewire which extends out of the proximal guidewire [port] opening in position, until the dilatation balloon on the balloon dilatation catheter is positioned within a desired location within the patient's coronary artery;

e) inflating the dilatation balloon at the desired [stenotic] location within the coronary artery to perform the balloon dilatation angioplasty procedure;

- f) ~~deflating the dilatation balloon; and~~
- g) ~~withdrawing the balloon dilatation catheter from the~~  
patient.

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26. (Amended) An elongated balloon dilatation catheter for performing an angioplasty procedure within a <sup>human</sup> patient's coronary artery which has means for the rapid exchange of the catheter over a guidewire without the utilization of an exchange wire or an extension wire, comprising:

- C3
- a) an elongated catheter shaft having proximal and distal ends and being configured for percutaneous introduction into the patient's femoral artery;
- b) a distal guidewire [port] opening in the distal end of the catheter shaft;
- c) a proximal guidewire [port] opening in the catheter shaft spaced a short distance proximally from the distal guidewire [port] opening and a substantial distance from the proximal end of the catheter shaft;
- d) a flexible distal shaft section configured to be advanceable within [a] the patient's coronary arteries having a guidewire-receiving inner lumen extending proximally from the distal guidewire [port] opening to the proximal guidewire [port] opening and having an inflation lumen coextensive at least in part with the guidewire-receiving inner lumen,

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d) an inflatable dilatation balloon on the distal shaft section having proximal and distal ends, and having an interior which is in fluid communication with the inflation lumen; and

e) a proximal shaft section much longer than the distal shaft section which is an elongated tubular member with a single inner lumen extending therein in fluid communication with the inflation lumen in the distal section and [having sufficient stiffness] which is suitable to advance the distal shaft section within a patient's coronary artery over a guidewire slidably disposed within the guidewire receiving inner lumen.

27. (Amended) The balloon dilatation catheter of claim 26 wherein the [inflatable dilatation balloon has with the] distal end of the balloon [being] is spaced closer to the distal guidewire [port] opening than the proximal end of the balloon is spaced to the proximal guidewire [port, and] opening.

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28. (Amended) An elongated balloon dilatation catheter for performing an angioplasty procedure within a patient's coronary artery which has means for the rapid exchange of the catheter over a guidewire without the utilization of an exchange wire or an extension wire, comprising:

a) an elongated catheter shaft having proximal and distal ends and being configured for percutaneous introduction into the patient's femoral artery;

b) a distal guidewire [port] opening in the distal end of the catheter shaft;

c) a proximal guidewire [port] opening in the catheter shaft spaced a short distance proximally from the distal guidewire [port] opening and a substantial distance from the proximal end of the catheter shaft;

d) a flexible distal shaft section configured to be advanceable within a patient's coronary arteries having

a first inner lumen which extends proximally from the distal guidewire [port] opening to the proximal guidewire [port] opening and which is configured to slidably receive a guidewire therein,

a second inner lumen which is coextensive at least in part with the guidewire-receiving first inner lumen and which is configured to direct inflation fluid therethrough,

a third inner lumen which is coextensive with the first inner lumen and which is configured to be in fluid communication with a second [port] opening in the distal end of the catheter shaft, and